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DEVOTED TO PHOTOGRAPHY IN ITS
WIDEST SENSE

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THOS. H. McCOLLIN, Managing Editor.

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JUDICIAL PHOTOGRAPHY.

H OW useful the camera and sensitive dry-plate have become in the administration of justice, is shown almost daily in the various courts throughout the land.

Strange to say, the camera was first called into requisition in the lowest grade of criminal procedure, viz., for the portraiture of criminals of all grades, from the petty thief to such as were accused of capital crimes. Pictures were wanted to serve for future identification, as well as to aid the officers of justice in the arrest and detection of suspected law-breakers. And well did the camera serve its purpose. This method of picturing professional criminals, dating back even to daguerreotype days, was adopted in the various cities, and soon led to an interchange of such portraits, if they may be so called, as in many cases the unwilling sitter did everything in his power to produce an unrecognizable picture. This system of exchanging criminal portraits by the officials of the larger cities soon resulted in quite large collections which may be inspected at police headquarters by the curious.

The name by which such municipal art galleries are known is the expressive one of "The Rogues' Gallery." A visit to the detective offices and an inspection of the albums will at a glance show that the collection has not been misnamed. Gradually the use of the camera has extended into the civil courts, where the comparatively new factor has been called into requisition for the detection of fraud, such as forgeries, and alteration of wills or documents of value; also for use as evidence in cases of damages for personal injuries resulting from railroad or street-car accidents. The same is true in cases of encroachment upon party lines, or where a building was injured by an adjoining operation. In many such cases photographs have formed a prominent feature during the trial with both judge and jury, often making the situation clear, which otherwise could only have been reached by a personal inspection.

Many are the important cases within the past decade which have been decided mainly upon the visible proof thus presented by means of the camera and its sensitive recording plate.

Perhaps one of the most interesting minor cases in which photography proved a silent but incontrovertible witness, was during the election cases tried in Philadelphia about a year ago, when the question of police intimidation and interference was an important issue.

According to the law police officers on duty are required by the statute to remain a certain distance from the polling booths. In this case it was suspected by the reform party that in some of the "slum" districts the officers not only interfered with the voters, but intimidated them as well. At such stations operators were placed with cameras, and snap-shots were quietly taken, and the time noted, thus showing the exact position and action of the derelict officials.

In due time the accusations were brought against the offenders, and as promptly denied under oath by the accused and their supporters. The production however of the photographs showed a different condition of affairs, which was followed by a prompt conviction of the offenders.

It is, however, in criminal jurisprudence that photography is destined to play its most important part, in bringing to light certain conditions not visible to the normal human eye. This is especially true in cases of forgery, either real or alleged. In instances where the genuineness of a signature has been called in question, and it becomes a matter for analytical photography, the heliographic processes have probably reached their highest development, and proved themselves to be among the greatest modern scientific methods within the reach of the courts.

Formerly where a signature was in question, whether genuine or spurious, so-called experts in handwriting were called upon to pass their judgment upon the document in question. These experts based their opinions upon some vague theory of their own, which often had no better foundation than their own abstract argument. Now, however, the search power of the camera is called into requisition, with most wonderful results. No erasure or alteration is so subtle that it cannot be discovered by the photographic expert and his modern appliances. So accurate are the present optical contrivances, so delicate the sensitive emulsions, that even a variation in the ink, or a previous tracing, can easily be shown upon the modern dry-plate. It is but necessary here to refer to the wonderful results achieved by Dr. Paul Jeserich, of Berlin, in this special branch of the photographic art.

The value of photography in judicial procedure has been proved in so many issues in the various courts, and its importance so well recognized by both bar and judiciary, that the time is not far distant, at least in our country, when a photographic expert as a sworn official will be as necessary an adjunct to the courts as a sworn interpreter. An official of this kind is as necessary for the service of the court as for the protection of the litigants. This fact, we believe, has long since been recognized by the Prussian government, under which Dr. Jeserich fills the position at Berlin.

It is a fact well known to all photographic experts that the modern proverb that "the camera cannot lie" is a tremendous fallacy. In the hands of a skillful operator, who works in the interest of an unscrupulous principal, the camera can with ease be manipulated so as to distort any signature or writing to suit the ends of the operator or the person who employs him. Then, again, even when the work is conscientiously performed, to be

absolutely accurate it requires the highest grade of optical appliances, such as are not in the possession of the ordinary photographer. This is another good reason why the photographic expert should be under the direction of the courts alone. As an illustration, the writer will mention a case that lately came under his personal notice. Two photographs were submitted by opposing counsel in a certain case. The difference between the two was obvious, yet both photographs had been made honestly and in good faith, and, as it afterwards turned out, from the same original. The great variation here was brought about simply by the difference in the ordinary lenses used by the photographers.

Criminal and judicial photography is a special branch of the art-science which requires the highest order of intelligence, keenness of judgment, scientific training, and the most modern apparatus. Any person competent to fill such a position should be placed upon the same footing as an interpreter, his duty to be to the court alone, without any interest in either side of the issue into which he was called. Further, he should be independent of the political changes incident to our system of government.

The day is not far off when such an official will be indispensable to the courts, and when all important documents will be photographed, and such fac-similes used during the trial of the case, thereby preventing any possibility of loss or mutilation of the paper upon which the issue depends.

Julius F. Sachse.

A Good Story is told of a certain locality in Tennessee where no newspapers are taken and the people "hears all they wants to know." A former citizen of this locality living in Texas, wrote to some of his old friends at his old home, and among other items of news stated that the immigrants were coming in so fast that they were eating all the corn up. The person to whom this epistle was addressed did not comprehend the meaning of the term "Immigrants," and inquired of all those he met if they knew what it was, but none could give him the desired information. It was finally determined to send it to a certain 'Squire in the neighborhood who presumed to know everything. The letter was read to him and he was asked: "What are immigrants?"

The 'Squire looked wise, crossed his legs, scratched his head and replied: "It's a little animal between a possum and a coon."

THE PROGRESS OF SCIENCE IN 1896.

THE discovery of the Roentgen rays overshadowed—if we may say so without a bull-all other scientific discoveries of the past year. Both the scientific and the popular world felt, as Lord Kelvin declared, that "the curtain had been drawn from before their eyes, and they had been allowed to look into some of the mysteries of nature." The experiments of the Wurzburg professor, which led to the finding of the "new light," which is now almost universally held to be electric in nature, were really made at the end of 1895, but were not communicated till the beginning of January of last year. By far the most important result of the discovery so far has been the application of the new rays to surgery. The possibility of using the new rays as a therapeutic agent is indicated by the fact that according to a communication in Nature of June 4th last, they can be used to kill the bacteria of diphtheria. Indeed, from a practical point of view the discovery of the Roentgen rays is the most hopeful made for many years. Probably the next most sensational feature of the year's scientific progress was the safe return of Nansen's "Fram" from the Polar ice after an absence of more than three years. The scientific results of the expedition are likely, when we know them in their entirety, to So far the results of the expedition have be very important. proved the accuracy of Nansen's theory with regard to the direction of the Arctic currents. It has further been proved that the Polar sea, instead of being, as was formerly supposed, a shallow basin, is, on the contrary, of great depth. Dr. Nansen believes that this sea extends to the Pole, and that on this side, at least, there is no important land. We must, however, await the explorer's full account before gauging the value of what must be considered, from every point of view, a memorable voyage.

Astronomers had great expectations of 1896, as likely to prove a year of great importance for their science. These expectations were hardly realized. The solar eclipse was rendered almost nugatory, from a scientific point of view, by un-

propitious weather. Except at the stations in Nova Zembla and Siberia no observations likely to prove of value were taken. Nor was the appearance of hosts of comets through the avant couriers of which our globe passed in the autumn as striking as was anticipated it would have been. The most marked advances which have been made in electricity, apart from the improvements in applying it as a motive force and for lighting, are in the direction of distant telegraphy without wires. referred so recently to the wonderful experiments of Mr. Preece and Signor Marconi that our readers are probably aware of the revolution in telegraphy which these experiments are calculated to bring about. The problem of supplanting steam by electric locomotion and gas by electricity as an illuminant has advanced slowly during the past year. During the past twelve months the number of electric tramways in Europe increased from 70 to 111, and their total length from 504 to 596 miles. Compared with the 596 miles of electric tram line in Europe, there are 12,133 miles in the United States. The utilization of Niagara Falls as a source of electric supply must be mentioned as one of the most remarkable developments of the year. The application of the dynamo and the motor to mechanical plowing-a matter of much concern to farmers—has been made in Germany with some success. The cost of working is said to be about one-half that with oxen. The introduction of electrically-propelled hansoms into London is an innovation of a far-reaching kind. The "sea serpent" and the "missing link" were both, as usual, exploited during 1896, but without emerging from their problematic existence. The year was one of unusual climatic and terrestrial disturbances. There was hardly a quarter of the globe in which some earthquake shock was not recorded. The destructive seismic wave which desolated the Japanese coast was of course the most stupendous occurrence of the kind for very many years. The cyclone of unusual severity which visited Paris in 1896 deserves also to be recorded as phenomenal; while the remarkable bog-slip in our own Kerry must rank with the most memorable events of the kind. The review of the year in science leads one to the impression that the fairy tales of science are fast being translated into sober prose. We are still, no doubt, merely on the threshold of that knowledge of nature and her secrets which we are destined to attain to in the future. Such a discovery as the Roentgen rays, for instance, by undermining our conceptions of solidity and opacity, opens up indefinite vistas of future discovery, and shows clearly how little final is our limited view of even those things with which we think ourselves most familiar.—The Freeman's Journal.

What to Eat .- Remarks of a Physician concerning Healthful Diet:

That much suffering and disease would be avoided if people knew just what to eat.

That one's diet should be suited to his vocation.

That the brain worker should have a farinaceous, vegetable and milk diet.

That the man who does a great amount of muscular labor needs a diet during the winter, requires fats and oils to keep up the temperature of of animal food.

That a dweller in cold climates, or one who works out in the open air the body.

That many diseases that come with advanced age, such as apoplexy, heart disease, gout, Bright's disease articular rheumatism, etc., are doubtless the result, in many cases, of a too free indulgence in animal food.

That only one food contains all the elements essential to sustain life, and can be used in its pure state by all without danger, and that is milk.

That this is food not only for muscle, but for bones, nerves, and the whole human economy.

That milk from unhealthy animals will surely cause disease, but that pure milk is not only an admirable food, but in many cases a curative agent.

That milk can be relied upon in 90 per cent. of cases in all sickness, no matter what the disease may be.

That in many cases, however, it must be adulterated with some preparation to make it acceptable to the digestive organs.

That for acidity of the stomach when hard, strong curds are formed by its use, two teaspooonfuls of lime-water should be added to each cup of milk.

That in case of biliousness and constipation add a pinch of salt.

That the milk should be boiled and a little magnesia added for diarrhoea.

That anyone can drink milk without inconvenience by adding one-third of its bulk of Vichy water.

PRODUCING PHOTOGRAPHS IN RELIEF.

M^{R. T. C. MARCEAU} has patented certain improvements in the art of finishing and mounting photographs after they have been taken, and the invention is especially designed to throw certain parts of the picture up into relief above the plain surface.

It consists in certain details of construction which are more fully explained by reference to the accompanying drawings, upon which

Fig. 1 is a view showing the manner of outlining the picture upon the surface in which the corresponding intaglio is to be produced.

Fig. 2 is a view showing the means for registering the pictures which are to be afterwards thrown up into relief.

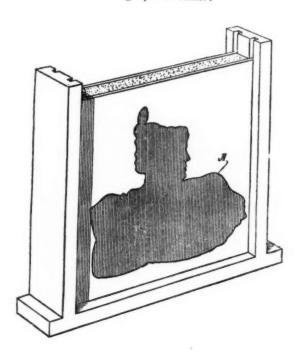
Fig. 3 is a vertical section through the mould.

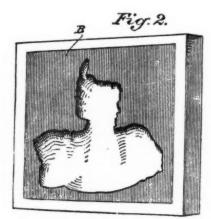
The object of the invention is to simplify the methods of making relief pictures, so that any number of such pictures may be made to accurately coincide and correspond with each other.

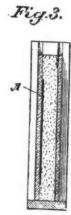
"In carrying out my process," says Mr. Morceau, "I first prepare a photographic negative in the usual manner. The pictures are then taken from the negative upon films of sensitized paper, and the outline of those portions which it is designed to show in relief is cut out from one of these sheets and pasted upon a surface of glass as shown at A.

"The paper upon which the pictures are taken is all cut of a certain size, and the negative is marked, so that this paper is always laid in the same position upon the negative for printing each picture. The pictures are therefore all in identically the same relative position upon the paper, and they all correspond with the one from which the outline was cut for the purpose of making the intaglio block.

"The exterior portion of the paper from which the outline has been cut now serves as a pattern for the exact registry of each of the pictures which are to be thrown up into relief, and is after-







wards used for this purpose, as will be hereafter more fully explained.

"The surface, A, upon which the figure is pasted, as previously described, forms one side of a mould, the space between the sides being sufficient to provide a necessary thickness, and the sides being also connected by edge strips so as to form an enclosure, as shown in fig. I.

"Into this enclosure I pour plaster of Paris or other plastic material which will afterwards set and become hard, filling the space within the mould.

"The plastic material flows around the figure which has been pasted upon the glass, and this figure, projecting the thickness of the paper above the surface of the glass, will form a corresponding indentation in the material with which the mould is filled, and which indentation remains after it has set.

"The mould is then opened, and the hardened material is taken out, the outline or figure is removed from the face of the plaster, if it has adhered thereto, and the perfect outline remains upon the surface.

"The surface of the block is now excavated or engraved out in the usual manner for producing intaglios, so as to form the various features of the picture to greater or less depth, as the shade or contour of the picture demands, and the taste of the artist shows to be proper.

"When this is completed, it is in readiness to receive the pictures which are to be thrown up into a relief corresponding with the depth of the intaglio which has thus been formed.

"The part, B, from which the figure was cut to form the outline upon the block, is now pasted, or otherwise attached, to the block, forming an accurate peripheral outline around the intaglio, and, as all the pictures are in exactly the same relative position upon the printed sheets, it is only necessary to register the edges of each sheet with that upon the block, to register each picture with the intaglio. The picture is wetted, and then pressed into the block by any of the usual or well-known means for producing raised surfaces, and those parts of the picture

which are designed to be thrown up into relief will be correspondingly forced into the various depressions of the intaglio in the block, remaining there under pressure until dried, after which they can be removed, and the pictures mounted in any usual or well-known style for mounting pictures.

"If preferred, any suitably prepared block may be used, and the outline within which the engraving or intaglio is to be made may be marked upon the surface of the block, by laying the cut-out figure thereon and outlining it, and afterwards engraving the block.

"A convenient method for effecting this is to lay the picture to be produced in relief upon a supplemental sheet, which is properly proportioned to the block, and then cut the outline of the picture, and at the same time cut through the supplemental sheet beneath, the two sheets being secured together so as to remain in the same relative position until the cut has been completed.

"The supplemental sheet may be made of any suitable material. I have found that collodion in thin sheets makes a very satisfactory substance for the purpose, but it will be manifest that other materials may be used without departing from my invention. This supplemental sheet is then laid upon the block, to which it is temporarily fixed by pins or clamps, and the outline which is to be engraved in the block is marked by following the outline of the cut. The sheet may then be removed and the engraving of the block completed. The pictures to be thrown into relief are then fitted to the opening in the supplemental sheet, and the picture and sheet are placed upon the block, the face of the picture coinciding with the intaglio which has been cut in the block, as in fig. 2.

"This registration is ensured by passing pins through the holes already made in the supplemental sheet and through the picture, these pins entering the holes previously made in the block, and after this is effected the pressure is applied to throw the picture up into relief by pressing the parts of it into the intaglio in the block.

"The claims are for:-

"I. The method of forming photographic pictures in relief, consisting in cutting out one set of pictures and outlining it upon a block formed by hardened a plastic mass within a mould, engraving an intaglio upon the block to correspond with said outline, then registering the other pictures upon the block, and ——Photo—galley I—Jan 18—office

pressing the portions coincident with the engraved surface thereinto.

"2. The method of forming pictures in relief, consisting in cutting the outline of one of the pictures and a supplemental sheet upon which it is overlaid, indicating said outline upon a block, and engraving an intaglio in said block corresponding with the outline, fitting the pictures successively to the opening in the supplemental sheet, inverting them and the sheet over the engraved surface, and retaining the pictures in register with said surface, while they are pressed thereinto by uniting the pictures and the supplemental sheet and entering corresponding holes in the block."—British Journal of Photography.

X-Rays Disclose the Needle.—A successful experiment was made in Effingham, Illinois, with the X-ray. Several weeks ago Mrs. A. J. Hackman, sister of Dr. Henry Eversman, cashier of Eversman, Wood & Engbring's bank, experienced a sudden and painful swelling of the left hand, which gradually progressed until it was feared amputation was necessary.

The attending physician then took his patient to the Illinois College of Photography and had President Bissell subject the hand to the X-ray, which located a sewing needle deeply imbedded in the flesh adjacent to the lower bone of the thumb.

Professor Bissell took a photograph of the hand with the embedded needle and has it on exhibition. The surgeons will have no trouble in removing the needle.

Since his success in the above and other cases presented, Mr. Bissell has determined to make the science of X-ray photography a permanent branch of his college and business, teaching it to students, and practicing it in connection with surgery for all physicians who may bring their patients to him, from far and near. It will prove a great boon to suffering humanity.

ACTION OF LIGHT UPON PHARMACEUTICAL PRODUCTS.

BY PROF. A. B. STEVENS.

A S we pass through chemical laboratories or dispensing pharmacies, the question arises, "How many pharmacists understand the wondrous action of light, or, if they understand, how many consider its action upon their pharmaceutical products?"

Few pharmacists pause and consider the effects produced upon the substances in their shelf bottles, which day after day, and sometimes month after month, are exposed not only to the action of light, but often of strong sunlight, constantly modifying, frequently impairing, and in many cases absolutely destroying the therapeutic value of the drug. Immerse a bit of white paper in strong sunlight for a few hours, compare with one that has been carefully protected from the light's action, observe the change, and consider the changes produced by this agent upon similar organic bodies. It is in obedience to this law of change that the thrifty housewife carefully excludes the midday sun from rugs and draperies.

Realizing the action of this powerful agent, the U. S. P. Committee on Revisions directed that nearly one hundred preparations should be protected. In view of the fact that these important pharmacopoeial directions are so frequently overlooked or ignored by pharmacists, the following list from the U. S. P., together with comments upon some of the most important preparations, is here given, in the hope that it may impress upon the minds of at least the younger members of the profession the necessity of a careful protection of these sensitive materials:

ARTICLES AFFECTED BY LIGHT.

Benzoic acid. Carbolic acid. Hydrobromic acid. Hydrochloric acid, nitric acid, nitric acid dilute, and nitrohydrochloric acid dilute. Nitro-hydrochloric acid. Hydrocyanic acid dilute. Sulphurous acid. Formic acid. Acetic ether. Ammonium iodide. Amyl nitrite. Sulphurated antimony. Apomorphine hydrochlorate. Stronger orange-flower. Chlorine water. Silver cyanide, iodide, nitrate, diluted nitrate, molded nitrate, and oxide. Arsenic iodide. Bismuth and Chloral and chloroform. ammonium citrate. Ferric citrate, iron and ammonia citrate, iron and ammonia tartrate, iron and potassium tartrate, iron and quinine citrate, soluble iron and quinine citrate, iron and strychnine citrate. Saccharated ferrous Soluble ferric phosphate and pyrophosphate. Mild mercurous chloride and mercuric cyanide. valerianate. Yellow mercurous iodide. Red mercuric iodide, yellow mercuric oxide, red mercuric oxide, yellow mercuric sulphate, ammoniated mercury, and mercury with chalk. Iodoform, solution ferric acetate, solution of chlorinated soda and methyl salicylate. Physostigmine salicylate and sulphate. Naphthol. iodide. Pyrogallol. All of the quinine salts. santonin. Sodium salicylate. Spirit of nitrous ether. Stronium iodide. Terebene. Tincture of chloride of iron.

OTHER CHEMICALS ACTED UPON BY LIGHT.

The action of light upon silver compounds is a problem upon which a vast amount of study and investigation has been expended. Few investigators agree as to the actual compounds formed, but nearly all have proven that the action is one of reduction.

Silver chloride, when fused repeatedly, or until all traces of the nitrate or organic impurities are lost, is unaffected by light. Niepce de St. Victor discovered that paper coated with egg albumin, and dipped in a solution of silver, is far more sensitive than when used with the silver salt alone. At the present time silver salts are invariably associated with albumin, gelatin, or collodion in all photographic plates.

Chloral becomes acid on exposure to light and air.

Chloroform, when absolute and all air is excluded, is not acted upon by sunlight, but in the presence of air is rapidly decomposed. The presence of more than 1½ per cent. of alcohol prevents decomposition; smaller quantities retard the action in proportion to the quantity present. In the absence of alcohol

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chlorine is liberated. In the presence of alcohol the chlorine is converted into hydrochloric acid. For further study of the action of light upon chloroform see *Pharmaceutical Journal and Transactions*, vol. 23, 1893, pages 792 and 1005.

Creosote, when pure, is not acted upon by light, but when a small quantity of tar oils is present, light darkens it.

Sulphurous acid is decomposed by light, forming free sulphur and oxygen. The oxygen combines with a portion of the sulphurous acid to form sulphuric acid—

$$SO_2 = S + O_2$$

 $2SO_2 + 2O + 2H_2O = H_2SO_4$

Hydrocyanic acid is decomposed by light and air, forming different substances under different conditions. The greatest care must be exercised to promote its preservation. The following is the method employed in the prescription department of one American School of Pharmacy. A block of wood whose dimensions are 2 in. by 2½ in. by 6 in. is procured. Eight holes of sufficient size that each will accommodate a dram vial are bored in this block. The vials, filled with freshly made hydrocyanic acid, are corked, placed in the holes prepared to receive them, and the holes closed with corks. When a prescription requiring this acid is received the acid is taken from one of the vials, and should any acid remain in the opened vial it is thrown away. This method insures fresh acid for each prescription.

Ferric Salts.—Inorganic ferric salts, when pure, are stable, but, when associated with organic compounds, they are invariably reduced to ferrous compounds by the action of light. For example, ferric chloride and the solution of ferric chloride are unaffected by light, while the alcoholic tincture of the solution is partly reduced to ferrous chloride—

$$\label{eq:Fe2Cl6+C2H6O} \text{Fe}_2\text{Cl}_6 + \text{C}_2\text{H}_6\text{O} = \, 2\text{FeCl}_2 + \text{C}_2\text{H}_4\text{O} + \text{HCl}.$$

Hence the U.S.P. directs that it shall be protected. Many of the ferric salts with organic acids are so sensitive to the action of light that they are used for photographing printing. The cyanotypes or blue prints are made by exposing paper coated with a solution of ammonio ferric tartrate and placed under a negative to the action of sunlight. When the iron is reduced to a ferrous condition, the paper is floated upon a solution of potassium ferro-cyanide, forming ferrous ferro-cyanide. The kallitype printing process is based upon the reduction of ferric oxalate to ferrous oxalate by light. Sodium ferric oxalate acts in a similar manner, producing an orange-colored image which is developed with a solution containing silver nitrate.

Mercurous chloride, when in the dark, is not acted upon by the air. Exposed to light it gradually darkens, indicating partial reduction.

Mercuric cyanide is affected in a similar manner.

Mercurous iodide is easily decomposed by light into mercuric iodide and mercury. Mercuric oxides, both red and yellow, are partially reduced by light.

Iodoform is decomposed by sunlight with the liberation of iodine.

Volatile oils are easily decomposed, and even alcoholic solutions are easily affected by the same agent. Therefore not only volatile oils but perfumes also should be protected.

The ornamental display of perfumes in clear glass bottles upon the case or shelves is a mistake. Exclude the light from them and the quality will be their best advertiser.

Spiritus ætheris nitrosi rapidly decomposes under the action of light and air, becoming acid. Samples have been found that had decomposed and refused to give a test for ethyl nitrite.

Syrup of ferrous iodide which has oxidised by the action of air may be completely reduced to the ferrous condition by exposure to sunlight. It has been suggested that an acid ferric salt might be formed in the sunlight. This, however, is not the case, as a small sample, exposed to sunlight for a period of six months, refused to yield more than the faintest ferric test.—Phi Chi Communicator.

Scientific.—Yeast—They say this new kind of photography brings out every bone.

Crimsonbeak-Well, I'll get my wife to try it on shad.



AMERICAN JOURNAL OF PHOTOGRAPHY.

FEBRUARY, 1897.



THE BEHAIM HOUSE.

NURNBERG, GERMANY.

FRANSFERRED LIGHT ACTION ON DRY PLATES

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The question, how is it possible that a latent picture, with all its details, can be thus transferred, can be answered, and the mystery solved, only by a full knowledge of how a latent picture comes into existence. For inasmuch as the transferred picture is also latent, it is plain that in its creation the same factors are active as in the original.

A latent picture, as is well known, is made by the light eliminating or removing a number of halogen molecules in a haloid silver film (bromide silver, for example). Let us, to better understand this, imagine the film in its mickness permeated with a number of indentations, corresponding in their greater or lesser depths with the relative stronger or weaker light actions, while the raised parts in the plants represent the exclusion of the chemically acting fight. The stronger the light effect, the deeper we must suppose the imaginary indentations, and it really is the greater upon the silver combined halogen thromide, for example). If we make up the loss of bromide, then the indentations disappear, the film is again complete there is no latent picture. The deepest indentations will naturally absorb more bromide, in order to disappear, that the shallower ness.

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On these facts rests the secret of the picture transfer; for if we place upon an exposed bromide of silver plate one that has

^{*} J. von Norath in Deutsche Photographen Zeitung.

not been exposed, bring them in close contact, we give a chance to the exposed (and consequently deficient in bromide) plate to indemnify itself (even though partially) at the expense of the unexposed plate. This actually occurs according to some unknown (perhaps diffusive) law. And as, morever, this indemnifying bromide is combined with silver, its loss to the unexposed plate must produce in it a picture in the same manner as was produced in the original by the light. Both pictures, however, must be weaker than the original was at first, the imaginary indentations of the transferred picture being formed only by a partial filling up of the indentations in the other picture.

The transferred picture is, of course, reversed. With sufficient development the transfer will be equal to the original. The less bromide the emulsion contains, the easier the transfer; highly-sensitive plates give the best results.

Perhaps objections will be raised against the supposition that the exposed silver bromide absorbs bromide from an unexposed plate, but if we remember that this always takes place with aqueous solutions, there is no reason to believe that this could not happen in the dry state. Rather must we suppose that many factors have, like the light, the property of eliminating bromide from its combination with silver in a dry state. Paper, for example, as has been proved, possesses this power, producing fogging.

The transfer of labels on unexposed plates may thus be explained. Plates packed in paper protected by paraffin do not show any fog if properly treated.

The transferred pictures are very sharp and well defined. In our own experience, it once happened that a plate exposed on a landscape accidently came in contact with an unexposed plate. The result was two opposites (one reversed), negatives (alike in every other respect), and of surprising sharpness.

With an emulsion rich in gelatine and of low sensitiveness, the experiment is less likely to succeed. From this reason I failed to obtain a transfer with artotype and chloride of silver.

The above facts are important, as they offer an explanation

of many other things, as for example, the weakening of chloride of silver gelatine emulsion prints that have been kept too long, or the flattening of pictures on bromide of silver gelatine plates kept for months undeveloped.

DR. SELLE'S PROCESS OF PHOTOGRAPHY IN NATURAL COLORS.*

Monochrome photography had hardly become an accomplished fact before experimenters were already busy at the task of discovering a process whereby objects might be photographed in the colors in which they present themselves to our vision. As far back as 1848, Becquerel gave his attention to the subject and devised an operation by means of which colored pictures could be obtained on sensitive paper; interesting as the experiments were, however, they possessed no value, since it was found impossible, first, to obtain fairly good coloring, and secondly, the colors could not be retained for any length of time. Since then many scientists and inventors have directed their efforts towards a solution of the fascinating problem, and they may be divided into two categories: those that tried to attain it by direct means, and those endeavoring to obtain their object by indirect means. In the first category M. Lippman stands alone. His manner of operating has already been brought so fully before the public that it will suffice to repeat that it is founded on the "interference of light waves," and that the results obtained by him have been truly surprising. But whilst, from the scientific point of view, his achievement is of great interest and importance, it does not possess the elements of economic value. To begin with, it demands an exposure of from one-half to as long as six hours; secondly, the intensity of the coloring changes according to the nature and condition of the light under which the pictures are viewed; and thirdly-and this

^{*} Read before the Royal Photographical Society, Dec. 21, 1896

is the greatest objection—the colors are only "illusionary," i.e., without body; consequently it forms, so to speak, a pure "negative" process, excluding the possibility of yielding reproductions, and without this there is obviously no practical utility. It really bears the same relation to color photography which the daguerreotype bore to photography proper. A practical solution of photography in colors by direct means may perhaps not be an impossible ideal, but so far, at any rate, it is still a subject for speculation, and there can be little doubt that for some time to come—if not forever—we must look for tangible results to a solution of the problem by indirect means.

All the endeavors connected with color photography by "indirect means," or, in other words, "positive" processes, have been founded on the Young-Helmholtz theory, on which I shall presently touch. Colors in nature are produced by a partial absorption of light on the part of the objects illuminated, the colored residue reflected being alone perceived by the eye. For instance, when white light plays upon carmine powder, the green and blue are absorbed, and consequently the carmine powder appears red. Similarly if white light plays upon the green leaf of a plant, red and blue are absorbed, and green alone is presented to the vision; in short, all objects appear in the colors which they do not absorb.

Now according to the Young-Helmholtz theory there are in the retina of the human eye fibres of three different kinds, each of which is sensitive to one of the three primary colors, and the eye does not perceive colors as a total, but it takes them up divided in the three colors, each set of nerve fibres absorbing the color to which it is sensitive, and it is only the nerves of the brain that unite them into a total impression, the unification being of course accomplished instantly. Therefore of all objects which contain more than one or two colors, our optical nerves take three pictures—a red, a blue, and a green, which are then merged by the nerves of the brain, and brought to our consciousness as a completed whole.

The promulgation of this theory was immediately followed by attempts to utilize it for the production of photographs in natural colors. Amongst the various abortive systems founded upon it the most notable was that of Ducos du Hauron, who in 1878 prepared papers covered respectively with yellow, blue and red sensitive gelatine. When such papers were used as positives, the portion of the gelatine submitted to exposure became more or less insoluble according to the greater or lesser degree of transparency. The soluble parts were then washed out by water, and there remained on each paper what may be called a gelatine stencil. The three stencils were then superposed and produced a picture in colors. But the operation, successful as it was as a curiosity, offered no value because the colors never came out correctly, and, secondly, the stencils were so fragile that it was almost an impossibility to superpose them twice in Subsequent researches emanating from various quarters served to create ingenious and, technically, more or less correct enunciations and deductions, yet when put into practice the results were anything but fortunate.

The difficulties encountered suggested still another variation of procedure, and we thus arrive at the developments of Vogel, Ullrich, Albert, Joly, Macdonough, Anderson, etc. As all these—making allowance for a difference in mechanical execution—rest on practically the same foundation, it is sufficient to dwell only on the achievements of Professor Vogel and Professor Joly. Neither of the systems which they represent can truly be called "photography in natural colors." Professor Joly's photographs are not in reality photographs in colors, but they appear as such by contemplation through his circumstantial color screen. The method has possibilities in its application to color printing, but—as far as can be ascertained up to now—it would appear to preclude uniformity in results, and the coloring is often very uncertain, if indeed it approaches nature.

The Vogel-Albert method does not attempt to produce color photographs, but is purely a printing process. It has been in existence for many years, although it has failed to fulfill the expectations it raised. It suffers from two drawbacks; first, it is impossible to obtain a truthful and clear coloring, because plastic body colors have to be employed, and secondly, it is incapable

of reproducing white, so that for this color an additional printing plate is required.

Photography in natural colors was still represented by the algebraic x when Dr. Selle at last brought forth a complete solution of the problem, and one valuable not only from the scientific but also from the practical point of view. Like his predecessors—with the already mentioned solitary exception of M. Lippmann-Dr. Selle took his departure from the theory of Young-Helmholtz. We have already dwelt on how coloring is produced in nature, and, taking this as a basis, Dr. Selle, in common with others, argued that we must obtain an exact reproduction of any given object if from a white surface—which absorbs no light-we extract equal quantities of red, green, and blue in the manner in which the object in nature extracts them from daylight; the residue conveyed to our perception must then in both cases be identical. Therefore what had to be done was to take three impessions of a subject by means of three plates each sensitive to one of the three primary colors; the result would then be three different images, which when colored with their complementary colors and then superposed, would produce a picture in the colors in which we see it. As to what primary colors ought to be chosen is a matter of difference of opinion; the main thing is that when mixed as optical colors they shall give white and when mixed as body colors they shall give black.

This sounds very simple, and so perhaps it is, but in actual practice there were enormous difficulties to be surmounted. Five years of constant effort had to elapse ere Dr. Selle reached success. To give an idea of the laboriousness of his task it may be mentioned that in the search for suitable complementary colors he tried over 200 different coloring substances.

Given the correctness of Dr. Selle's deductions there remained four points to be carried out.

- To find three perfect light filters through which to take the negatives.
- To render the negatives sensitive to a degree that would not require a protracted exposure.
- 3. To find the best substance for the positives.

4. To find complementary colors corresponding exactly to the light filters without which a faithful rendering of the colors in nature would be impossible.

It would be tedious and serve no purpose to enumerate the different stages through which Dr. Selle had to advance before arriving at a satisfactory issue, and it is as well to pass at once to a description of his process.

As will be shown by illustrations he uses a blue-violet, a green and a red filter for taking the negatives; from these negatives, developed in the usual manner, he obtains through the action of sunlight three positives. The positives are made on very thin films of chromated gelatine on a collodion substratum, a substance possessing the property of altering after exposure in the sense that those parts on which light has acted will take analine color whilst the other parts will not. Each of the positives thus produced he develops in a bath containing a solution of its complementary color; for instance, the red positive in a solution of methyl blue, the green positive in a solution of fuchsin, and the blue positive in a solution of heliathin, the devlopment taking only a few minutes. In this connection it may be remarked that Dr. Selle has discovered a comparatively simple way of determining the complementary color to any shade without the assistance of the spectroscope, a factor which he acknowledges has helped him considerably in arriving at his wonderful effects. The positive films just described, after having been dried, are placed one on top of the other, and a finished picture results. The superposing is effected by pressing transfer paper on to the positive 2; the latter is thereby taken up and then placed on positive 1. Positive 3 having then been taken up in the same manner, is placed on positive 2. The superposition obviously requires a very accurate register, and at first sight this may appear to present great difficulty, but in reality it is effected very easily and rapidly by means of the transfer papers, and only such skill is required as any ordinary person would be possessed of.

As will be seen from the illustrations to be shown presently, Dr. Selle obtains every gradation of color from white to black, and the colors, whilst being clear and sharp, yet merge beautifully one into another. In one of the pictures it will be observed that the curious reflection produced by light striking on panes of glass is faithfully reproduced.

Granted that Dr. Selle has solved the problem of photography in natural colors, it may rightly be remarked that unless his process requires a short period of exposure it would only be applicable to inanimate objects. Well, he has rendered the negatives so sensitive that now he requires only an exposure of under ten seconds. He is confident of reducing this time by one-half within the next few weeks, and what is more, he has every reason to believe that even within these next few weeks he will have succeeded in bringing this down to instantaneousness. Unfortunately he has been unwell for some time past, and at this moment is unfit for work; this is also the reason why, to his regret, he has been unable to supply in time for this lecture the latest and absolutely perfect photographs, including portraits, which therefore will be submitted at another time.

A development of the process fraught with great economical importance is its application to color printing. With the assistance of Mr. Frisch, one of the foremost lithographers of Berlin, this development has been brought to a marvelously successful issue, as may be judged from the several prints made from Dr. Selle's negatives. The printing is done either by heliography, lithography, or letterpress printing, at much less cost than that of any other process now known. In heliography the negatives are transferred to gelatine blocks from which 2,000 to 3,000 impressions can be taken, and the result is little, if at all inferior to the photographs, although the velvety softness of the latter is to a certain extent lost.

In examining Dr. Selle's process hypercritics may say that his invention is not new, and they may point to Ducos du Hauron as having anticipated his idea. Admitting that Dr. Selle has not discovered a new principle, that he has levied tribute on previous researches, and that he has profited by the experiences of predecessors, yet it cannot be denied that in the main his process is an original invention, that he has succeeded in turning into an accomplished fact that which had hitherto had been only a possi-

bility, and what is more, that he has solved the problem in a manner so simple as to render color photography as easy as ordinary photography.

I will now show some negatives and positives with a view to illustrating the process. They were taken nearly a year ago, when the necessary time for exposure was still 50 seconds, and at that period the degree of perfection recently obtained had not yet been reached.

The first slides to be shown represent the different stages in a reproduction of the show-card of a firm of color manufacturers.

- The following slides were then shown:—

 1. The negative taken behind a blue-violet filter, the filter itself being given in the margin.
 - The second negative taken behind a green light filter, as shown in the margin.
 - The third negative taken behind a red filter, as shown in the margin.

These negatives have been developed in the usual manner, positives are taken therefrom in the way already explained. The positives after development in the respective complementary color baths appear thus:

- The first positive taken from the blue-violet filter negative and developed in a complementary yellow bath.
- 5. The second positive taken from the green light filter and developed in a complementary pink bath.
- The third positive taken from the red filter negative and developed in a complementary blueish bath.
- This is the result, after superposing these three positives
 —the finished picture.

You will observe that this shade card contains over 100 colors from white in the first parallelogram to black in the last parallelogram. Under each color is the name of the shade. The wording it will be seen is black as in the printed original, and it would not appear black unless the superposition were accurate; neither for that matter would the white in the first parallelogram appear white. This, therefore, proves that the superposition can be done perfectly.

- 8. Two photographs taken from the show-cards of a wine merchant.
- 9. A photographic reproduction of a stained glass window.
- A reproduction of the butterfly "Morpho Cypris" taken from nature.
- II. A dish with natural flowers on it.
- 12. A winter scene taken from nature. In the upper windows you will observe the rendering of the curious reflections produced by light striking panes of glass.
- 13. Another scene taken from nature. In the corner you will observe a barrow. The color of the latter was really dark brown, but as it happened it was taken away before the second and third filters were brought into play and therefore whilst all the rest of the picture is correctly colored, the barrow appears red, i.e., in the color complementary to the first light filter.
- 14. A photographic copy of a reproduction of Guido Reni's picture, "The Procession of Helios."

The Shingle Fills the Bill.—"Have you children?" asked the canvasser as he stepped in the doorway.

"I have," replied the man at the desk without looking up.

"Then you will find this book-"

"Don't want it!" interrupted the man at the desk.

"But you don't understand," persisted the canvasser. "I can assure you that you will find it a great help in correcting children. It is by one who—"

"Not big enough," interposed the man at the desk, after one quick glance at the book. "Besides, I already have a shingle that seems to answer the purpose."

"Money should never be inclosed in letters for transmission through the mails," remarked an old post-office inspector the other day. "Money orders are cheap, and money in a letter offers a constant temptation to those who handle the mail. It is practically impossible to place money in a letter so that a postal clerk into whose hands the letter falls will not instantly detect it. Paper money has a peculiar odor unlike anything else on earth, and the clerk who is dishonest uses his sense of smell in spotting valuable letters rather than the sense of touch."

THE MAGIC AND MYSTERY OF PHOTOGRAPHY.

BY J. A. RANDALL.*

(Continued from page 30,)

GHOSTS BY PHOSPHORESCENCE.—By taking advantage of selfluminous substances various means can be designed for making ghostly images upon a sensitive plate. For instance, a phosphorescent tablet may be prepared and so arranged in the dark slide that it will give an impression whilst the plate is in the slide before and after the exposure, a luminosity imperceptible to the eye being sufficient to give an image, that with a little imagination, will pass for a spirit form. Again, as with sulphate of quinine, the background could be painted with a ghostly outline in luminous paint, a flashlight exposure being then made to impress the image of the medium, and next an exposure of twenty or thirty minutes in the dark room to secure the spirit form. The luminous paint in the background having been excited by the flashlight would emit sufficient light to impress a sensitive plate, but not enough to be visible to the eye of an observer. It is interesting to notice here that this method-that is, a short flashlight exposure and a long exposure in the darkwas followed in a noted case of spirit photography a few years back. These, however, might have been the result of causes little understood, and which I will next endeavor to make clear by stating a theory of my own based on the dark-ray photography of Abney.

Abney's Dark-ray Emulsion.—Abney succeeded in photographing the invisible long before the rise of Roentgen, making some experiments quite as extraordinary as many made by the X rays, and using a purely photographic method. The process is little known, for Abney generally keeps to the strict path of scientific virtue, going very little out of his way to make any of those simple and striking experiments that readily seize the popular imagination. He has, however, published a few that exhibit the possibilities of the process. Abney wanted a salt

^{*} Photographic (London) News.

sensitive to the dark rays of the spectrum below the red; after some trouble he managed to prepare an emulsion of silver bromide in collodion that gave him the desired sensitiveness—that is, a silver bromide in such a molecular condition as to be capable of impression by the radiations from a piece of heated iron before it reaches the red-hot state-invisible rays to the human eye, yet visible to the photographic plate. To prove this Abney performed two experiments. A plate was coated with the dark-ray emulsion, and an eighth of an inch above its surface a sheet of cardboard, having several holes through it, was placed: half an inch above the cardboard a kettle containing boiling water was next arranged. The kettle remained for a short time when, on removing the plate and developing, dark smudges came up corresponding with the apertures in the cardboard, the silver bromide having been acted upon solely by the invisible radiations from the boiling water. In the second experiment the carbon points of an electric arc were focussed upon a sheet of ebonite of considerable thickness; at the opposite side the darkray plate was fixed, and, after an exposure of only thirty seconds, an image of the arc light was seen upon developing the plate, the ebonite being quite transparent to the dark rays. From these experiments it is manifest that objects may be photographed in absolute darkness, provided they are of sufficient warmth to impress a plate sensitive to low radiations. Thus the human body might be so photographed, the exposure required being just the difference between a hot kettle five-eighths of an inch from the plate, with a few seconds' exposure, and the radiant heat of the human body five or six feet from the camera. The ordinary gelatine plate is not sensitive to these low radiations, but it is probable that some kinds of plates do contain small quantities of silver bromide in the desired condition, for it is well known that the safest red light will act upon them, even giving the outlines of objects placed on the film after a prolonged exposure. Now, in my opinion, some of the so-called spirit photographs have been the result of a similar action, The account given by one who produced such forms reads as follows:-" The next object is to render the air in the room motionless, and as light, heat, and conversation produce motion, the operator puts out the light and takes off the cap." The medium after sitting before the camera in complete darkness for an hour, the air becomes motionless and the operator makes an exposure with magnesium ribbon, the object being to secure the spirit from the motionless air. On development the form of the medium, and a superimposed spirit form, will come up on the plate if the conditions have been favorable. How far the spirit form is caused by the preliminary exposure of one hour upon the material medium I have never had the courage to test. Perhaps some reader with the patience of Job and a steady nerve will experiment, and either confirm or refute. A full account of Abney's mode of preparing the darkray emulsion can be found in the "Phil. Trans." of 1880 or The Photographic News of that year.

MOSER AND HIS IMAGES. - Should anyone inquire of me, "Who was Moser?" I could but reveal my ignorance of his personality, for he is only known to me as the originator of some of the prettiest experiments upon images ever made, these having a relation to photography which at a future time may be of greater importance than they are at present. Now they are mysterious and unaccountable. Moser was great at theory, and surpassed Milton's famous phrase of "darkness visible" by postulating what he called "invisible light," though it is beyond the wit of man to form the tangible idea of a "visible darkness" or an "invisible light." According to Moser, all bodies radiate light even in complete darkness, giving out and mutually absorbing light one from the other. In some bodies it remains visible; for instance, if a nasturtium is plucked from the bright sunshine and carried into the dark it will remain visible by the light it emits. Moser asserted this property to all bodies, and gave his images as examples. These images were produced also by Hunt, who says:-" I placed upon a well-polished copper plate a sovereign, a shilling, a large silver medal, and a penny. The plate was gently warmed by passing a spirit lamp along its under surface; when cold the plate was exposed to the vapor of mercury; each piece had made its impression, but those made by the gold and the large medal were more distinct; not only was the disc marked, but the lettering on each was copied." The simple contact had so changed the surface of the plate that vapor would deposit upon it in varying amounts. The persistence of these images is remarkable, Draper points this out :- "I have often noticed that if a piece of very cool or clear glass, or, what is better, a cold polished metallic reflector, has a little object such as a piece of metal laid upon it, and the surface be breathed over once, the object being then carefully removed, as often as you breathe again on the surface a spectral image of it may be seen. During the cold weather last winter I produced such an image on the mirror of my heliostat; it could be revived by breathing on the metal many weeks afterwards, nor did it finally disappear until the end of several months." Into the cause of these images I shall not enter, nor discuss the theories of "invisible light." heat, organic matter, or electricity, which have been put forward as explanations, but will only emphasize the fact that the simple pressure of a coin on a plate produces so violent a re-arrangement of matter that vapors discriminate between touched and untouched parts, and the images persist for weeks afterwards. Moser's images also show that numerous substances might be employed as photographic plates if only a developer could be found, and that images may be produced without the aid of light. I will next give a process for making pictures in vapor or condensation images.

PICTURES IN VAPOR.—John Harmer introduced this process, by means of which, upon breathing or causing moisure to condense upon a collodion film, an image, before invisible, comes into sight. The method is based on the carbon process for making transparencies. In choosing the tissue, if the negative is a dense one, the ordinary tissue used for transparencies will do; but if the negative be weaker in character, it will be well to use a tissue not so loaded with coloring matter. The bichromate bath should not be stronger that five per cent. In making the tissue sensitive, all the conditions for producing

vigorous and brilliant transparencies, such as short immersion, in the solution, squeegeeing off, quick drying, and speedy use must be observed. A condition of solubility excessive for ordinary work will, in the present case, be found favorable. Expose as for a lantern transparency, and on taking the tissue from the frame collodionize it in the usual way with a collodion composed of five grains of pyroxyline dissolved in an ounce of a mixture of equal parts of methylated spirit and methylated ether. Allow to partially dry. A clean glass is next taken and coated from the same collodion, then washed in clean cold water until the greasiness has disappeared, when it is ready to receive the tissue. The tissue may now be plunged into the water and left for a minute or so, but not till it begins to curl outwards, or the powers of absorption will have gone too far to the detriment of the final vapor picture. When ready the glass and tissue upon it are lifted out of the water, squeegeed in the usual way, covered with two or three folds of blotting paper, and placed under a weight for a hour or more, after which the glass is taken and stripped, the tissue being pulled away from the layer of collodion. It is then put aside to dry. That the layer of collodion on the tissue should not be too thorny or dried too much, nor the tissue allowed to absorb too much water, are all-important points. When the plate is quite dry its surface will have a glassy appearance, which will not exhibit any peculiarity until a moisture is condensed upon it; then it will be found that the film is capable of disposing of what, on a clean plate of glass, would be an even layer of fog in such a way that a picture containing the most delicate gradations is visible. The image disappears as the moisture evaporates, and reappears when subjected to its influence.

IMAGES FROM THE UNKNOWN.—It is no uncommon experience to find upon new plates certain images for which there seem no possible explanation, their startling and unaccountable appearance being "wropt in mistry," causing astonishment not unmixed with uncanny feeling. A gentleman made an exposure upon the interior of a friend's house; he was doubtful of the time, and proceeded to develop for under-exposure; to his great surprise

the plate developed quickly, and to his greater surprise the image was an interior quite different from that upon which he had exposed. The plate was from a fresh box and could not possibly have had a previous exposure. Another instance of the kind, having quite a sensational and tragic ending, is on record. An exposure was made upon a view having a river in the foreground. The photographer, whilst developing this peculiar plate, was perfectly astounded by an appearance which he had not seen whilst taking the photograph, and for which he could in no way account. On completing the development there was plainly revealed, in the foreground of the picture, the figure of a woman, apparently floating upright in the water. Not many weeks after, to complete the mystery, the body of a woman was found in the river at the exact spot where the photograph had taken. Again, not long since, the daily papers were agitated over the account of a traveling photographer, who, upon making an exposure upon the exterior of a reputed haunted house, discovered at one of the windows a portrait of the murdered man through whom the house had gained its evil name. In another case three distinct images, having no connection one with the other, were impressed upon a single film. The plate was exposed upon a garden in the evening-nothing remarkable being seen-but when placed in the developer a man's hat of old-fashioned shape, a child's dress, and a dog were distributed over the image of the garden. Such mysterious images were more common in the days of wet plates than now. A few years back Prof. Burton investigated the matter. Upon tracing back the history of the glass he found that it had been used for other films, and that the images which appeared undoubtedly arose from the remains of previous images. Though old glass was thus proved to be the source of the ghosts. it only deepened the scientific mystery, whilst it cleared away the supernatural. The glass traced by Burton had been washed for some weeks, immersed in strong nitric acid, and every means taken to ensure chemical cleanliness, yet, in spite of all this, enough energy remained latent to form a developable image upon the new film, whether by chemical or physical force remains to

be discovered. A complete solution of the difficulty would probably throw considerable light upon the nature of photographic images in general; at least, it seems to indicate that light is not absolutely essential in the formation of latent images in a sensitive film; and, in fact, several processes for giving images without light have been discovered.

VOICE PHOTOGRAPHY.—The transmission of sound by agency of light is the problem of the immediate future, and, to use a common phrase, "there is money in it." The allied problem, the conversion of light into sound, its transmission through space, and re-conversion into light, is somewhat remote, but it would be rash to say that it is not possible of solution.

Selenium, and many other bodies in thin sheets, such as hard rubber, ebonite, metals, ivory, and paper, will give sounds under the influence of intermittent light. Mercadier enclosed lampblack, cotton, woollen threads, and cork in a small tube connected with an ear trumpet, and caused light to fall upon them through a revolving disc. Distinct sounds were given out by these bodies. Thus light was converted into sound. Friese Greene has also explored this out-of-the-way field; he published a method for converting sound vibrations into photographic action. His plan of photographing the vibrations of the human voice is both simple and neat. A piece of parchment is first obtained and stretched like a drum; upon the centre a very thin piece of silver-polished glass is pasted. A ray of light coming through a pinhole having a piece of talc, colored green, before it, directed to fall upon the polished silver glass. The reflected ray is carried on until it strikes a sensitive plate. This plate must be arranged to move gradually, and be at a distance of three feet from the reflector. Start the plate moving and speak into the drum from behind the silver reflector, and the vibrations of the parchment diaphragm caused by talking into it will be recorded upon the sensitive plate when developed. Different voices will give different waves on the plate, and it is said that in the case of the vowels repeated singly these waves are wonderfully uniform. It has often occurred to me that the sensitive flame could be utilized

to give a voice record if focussed upon a sensitive plate, kept in motion during the fluctuations of the flame under the action of sound.

(To be continued.)

PROCEEDINGS OF THE FENNSYLVANIA ASSOCIATION.

The Photographers' Association of Pennsylvania held its first meeting in Russ Hall, Harrisburg, Pa., January 26th, 1897. The meeting was called to order at 10.30 a.m., by the President, M. R. Hemperly, of Philadelphia.

Mayor Patterson, of Harrisburg, delivered the address of welcome, which was as follows:

"Mr. President and representatives of the Photographers' Association, including the representatives of the fair sex, my words will be very brief this morning. I left a sick bed this morning in order to fulfill a promise made a few days ago to the Committee on Arrangements. We extend to you a hearty welcome.

"I was informed by your worthy President that I must be brief on account of some very urgent business that must follow immediately. I desire to say, however, that Harrisburg is favored with many gatherings of representative bodies of all characters, but it affords me pleasure this morning on behalf of the people of this city, to extend a cordial and generous welcome to the representative and intelligent persons now present. The progress made in the art and science of photography, as shown in the exhibits made here this morning, exceed all calculations made in the past year. (Applause.) The development made already will take much time to eliminate. Upon what has been accomplished and what may be accomplished in the near future, I need not speak. You know already that I am physically unable to be here this morning, and I just want to add that you have a hearty and generous welcome to the hospitality of our city. May your sessions be beneficial to the Association and a pleasure to you as individuals."

The President responded in the following words:

"Ladies and gentlemen: I know that you will all agree with me in making a response to such a generous welcome as this, that we will do it with hearty thanks, and what we say, will, as the Mayor has said, be very brief, because we are anxious to hear some interesting words from our dear old friend, Mr. Charles Hetherington, who has traveled all the way from Chicago to be with us. On account of illness which demands his

return, we will have his talk this morning, and will listen with the greatest interest to what he has to tell us. We extend our heartiest thanks to the Mayor and to the city of Harrisburg for their kind reception." (Applause).

Mr. Charles Hetherington, of Chicago, then stepped to the front and opened his talk, which was full of good things for the members, with the following:

"Mr. President, Dear friends: They say that the Keystone state is a very slow one, but I will never say it again after this Convention. For the first Convention it is a grand success as far as the pictures are concerned."

He then gave a very interesting talk on the different points in photography, and then proceeded to criticize pictures. He showed how they were made and how they should be made to give the best results. He concluded his spicy talk with the following words:

"I am more than pleased with the magnificent display here to-day. This is the first Convention, and as I am an old attendant at conventions, in fact I do not do anything else, I must say this one far exceeds my expectations. The first state to hold a convention of this kind was Iowa and it was a grand affair, and I am glad that Pennsylvania has started in with such a grand success. You will all be a great deal better for meeting together as you do, even though it is only to exchange an idea or to grasp each other by the hand.

"The public appreciate our work, and never have the strides been greater in our art than at present. Of course the small camera has done us some harm but now they are doing us good. The Roentgen rays and wonderful discoveries made by Mr. Edison, and on which he is constantly working, are bringing to light things never before thought of.

"Now, do not criticize another's work. It will only cause hard feeling. Ohio has a great state convention and this is on account of the fraternal feeling existing there. May Pennsylvania be the same. Your exhibits here are most magnificent, and I have never seen work compared to that on these walls. I hope to meet you all next year, when I may be with you for a longer time." (Applause).

As Mr. Hetherington had to leave the city his talk was made very short.

Mr. Schreiver then moved that a vote of hearty thanks be extended to Mr. Hetherington for his kindness and the amount of good done. The motion was carried with round after round of applause.

The following motion was then made by Mr. Schreiver: "I move that this Association extend to members of the press of Harrisburg our heartiest thanks for the interest taken and the good done the Association." The motion was carried.

The reading of the minutes of the previous meeting was dispensed with on motion.

The President then appointed the following Nominating Committee: Mr. Flickinger, of Bethlehem; Mr. Kellmer, of Hazleton; and Mr. Coombs, of Sharon. The Committee to report at 10 o'clock on Wednesday morning.

The President, Mr. Hemperly, then made his report for the year, which was received with a great deal of pleasure by the Association.

The report in detail is as follows:

"Ladies and Gentlemen of the Photographers' Association of Pennsylvania: Your President's report at this, our first Convention, cannot of course be very lengthy in its entirety, nor very voluminous as to its recommendations for your future guidance, for one short year of experience has scarcely removed us, we may say, from our swaddling clothes, or advanced us far enough to ripen our judgment for action. Yet that one year of our existence has brought plenty of work to your Executive Board, and with it has come a development of ideas and suggestions for facilitating the progress of our Association's usefulness to its membership, and its importance to the public. For, to those who have given real thought to the possibilities of an organization of this kind, the scope of its true sphere lies far above the mere coming together of its members and distributing among them a few paltry prizes. Of course, therein lies encouragement to greater effort and the hope of a grand betterment of the art of Photography. But the strength of our organization and the healthfulness of our existence will wield a powerful influence upon the public mind as to the importance of giving photography its rightful place clothed with all the dignity and respect conceded to the finer arts to-day. And on this line of thought I would earnestly urge you and all photographers to give serious consideration so that they may see that the hearty co-operation of each one to such an organization as ours is a duty which concerns not only their individual benefit, but that their helping hand is an added power towards the uplifting of the whole craft. passed through a year of none too good a business to the most of our members, and business depression is always discouraging to healthy membership in organizations. Yet, I think we have every reason to be grateful for our strength to-day, and if each one will put his shoulder to the wheel, we will soon be rolling on to a success little thought of by the few originators of this Association.

"Your Executive Board has of course made mistakes, we can see some of them now, are willing to admit them and be forgiven. Many things have perhaps been left undone. But our lack of experience must appeal to your leniency. If our humble efforts as pioneers shall have shorn away some of the thorns from the pathway of our successors, we shall feel amply repaid and perfectly satisfied."

The Secretary then read several communications of minor importance. Next in order was the time and place of next meeting. Mr. Kellmer suggested that a month later would be a much more suitable time, and Mr. Schreiversaid he had received letters from seventeen different photographers saying they would have exhibited had the meeting been a month later. Mr. Kellmer then made a motion to the following effect: "That the Executive Committee be instructed to hold the next Convention a month later." The motion was carried.

There was some discussion as to whether the next Convention should be held in Philadelphia or Altoona. It was finally decided to hold it in Altoona, on motion of Mr. Seavy.

Mr. Schreiver, of Philadelphia, then made a few remarks on the Copyright law. After a general discussion the President, after a motion by Mr. South, appointed a committee to draw up a resolution to be adopted by the Convention relative to the Copyright law. The committee was as follows: Mr. Schreiver, Mr. South and Mr Charles Griffin.

Mr. W. C. South, of Philadelphia, then made a very interesting address on "Landscape Photography." His remarks were full of bright sayings and very instructive.

The Convention then adjourned to meet at two o'clock.

The President called the meeting to order at half-past two.

Roger L. Kirk, of Philadelphia, was announced as the winner of the prize offered by Mr. Buchanan, of Philadelphia, to the traveling man obtaining the largest number of members during the year for the Association. Mr. Kirk had increased the membership from forty (40) to one hundred and thirty-six (136). He was called to the stand and made a very neat little speech.

There being no new business, Mr. Seavy moved that a committee of three be appointed to revise the By-Laws and the Constitution. The committee to report at the meeting Wednesday morning. The motion was carried. The following is the committee: Mr. F. E. Seavy, Mr. Fritsch and Mr. Thomas.

Mr. C. O. Towles, of Maryland, then read a very interesting paper, and suggested that photographers from the state of Maryland be allowed to join the Photographers' Association of Pennsylvania. His paper was heard with earnest attention and was heartily applauded.

The President then made some very complimentary remarks about Abraham Bogardus. He said he was an ideal man and a very fine figure in the conventions he attended. He said they would listen very attentively to the paper to be read, said paper being written by Mr. Bogardus. The Secretary then read the paper, entitled, "Ideals in Photography; Good of the Association." It was listened to very closely and received hearty applause.

Mr. Moorehouse, of Bedford, Mr. Thomas, of Shamokin, Mr. Fritsch, and Mr. Horgan spoke on the poor quality of printing-out paper.

Mr. Schreiver then moved that the Association extend to Mr. Towles a hearty vote of thanks for his very able paper read. The motion was carried amid applause.

Mr. Schreiver also moved that the Association extend a vote of thanks to Mr. Abraham Bogardus for his able paper, and make him an honorary life member of the Association. This motion was so well received that the President was compelled to make a little speech after it was carried.

Mr. Hathaway, of Sprague & Hathaway, then made a short address, in which he said he had never seen a finer display than was on the walls of the hall, and that they had made a grand beginning. He further said: "To act as a spur I will give to each winner of a prize in each class, this year and next, a sepia or water color, 25 x 30, suitably framed." This will be a big inducement to greater effort.

On motion of Mr. Seavy, the Convention adjourned to meet at half-past seven.

The President called the meeting to order at eight o'clock. He said: "We have with us this evening a favorite in the art of photography. A gentleman of whom perhaps you have all heard for years. A man who is able to instruct all of us. He came all the way from New York to do it, and when we take into consideration that this is an undertaking at this time of year and his kind of weather, I think we should have had a larger attendance than we have here to-night. I take pleasure in introducing to you Mr. G. G. Rockwood, of New York."

Mr. Rockwood said: "This exhibit is of a far higher average than a number of the national exhibits so far. I was so ashamed of the exhibit at the World's Fair that I got out as fast as I could. I would be proud if I were an exhibitor here to-night.

"You are to be congratulated also on the fact that you had with you Mr. Charles Hetherington, and I know how much disappointed you were when he could not be with you to-night. I know how much good he is able to do and how much good he did do you."

He then delivered a talk on "Posing," and then gave quite a nice little speech on "Single Skylights," and illustrated by drawings.

Different members of the Association then asked him questions relating to different points in the art of photography, to all of which he returned satisfactory answers.

Mr. Schreiver then moved that the Association tender Mr. Rockwood a vote of thanks for the very able manner in which he had enlightened them so thoroughly on such very intricate points. The motion carried with a great burst of feeling.

The Convention then adjourned to meet Wednesday morning at ten o'clock.

Wednesday Morning, January 27th, 1897.

The President called the meeting to order at 10.45 a.m.

The Secretary read a communication from Mrs. Fitzgibbon Clark, of St. Louis, Mo., wishing the Convention success.

Mr. Hemperly, the President, then called for the report of the Nominating Committee. Said committee reported as follows:

For President, S. Taylor Griffin, of Wilkesbarre; 1st Vice-President, E. E. Seavy, of New Castle; 2d Vice-President, Elwood Newell, of Philadelphia; Secretary, T. B. Clark, Indiana, and Treasurer, W. I. Goldman, of Reading.

The President then asked if there were any other nominations for President, Vice-Presidents, etc., taking them in order. Mr. W. C. South, of Philadelphia, was nominated for second Vice-President, and that was the only office for which there was more than one nominee. It was then moved that for all of the offices in which there was no competing nomination, the Secretary should cast the ballot. This motion carried. The President appointed the following tellers: Mr. Musser, of Harrisburg, Mr. Sturn, of Wilkesbarre, and Mr. Hyemets, of Chester. The members then balloted for second Vice-President. Mr. South received ten (10) votes and Mr. Newell fifty (50). Mr. Newell was declared elected. The officers are as follows:

President, S. Taylor Griffin, of Philadelphia.

1st Vice-President, E. E. Seavy, of New Castle.

2d Vice-Prsident, Elwood Newell, of Philadelphia.

Secretary, T. B. Clark, of Indiana.

Treasurer, W. I. Goldman, of Reading.

Mr. South, the defeated candidate for the office of second Vice-President, then made a very gracious motion, moving that the election of Mr. Newell be made unanimous. The motion was carried amid a storm of applause.

The next thing on the programme was a talk by Mr. C. M. Hays, the National President, but he was unable to be present. The President, Mr. Hemperly, expressed his sorrow at the absence of Mr. Hays, and said, that although they were having a number of disappointments, yet he hoped that in the aggregate the Convention would be a success. He then said the members were at liberty to say anything they thought would be for the common good.

Mr. Buchanan, of Philadelphia, said he thought the Association should adopt some permanent emblem so that they would not continually be at expense each year in getting new buttons.

Mr. Thomas moved that a keystone be adopted, having on the bar the

year, and adding a bar each year. But Mr. Buchanan said that as the members never had any trouble in finding a bar, except at "Kent House" (laughter) that he thought it would be rather burdensome to have a badge of the kind Mr. Thomas suggested. Finally Mr. Holden moved that a committee of three be appointed to select and have made a badge or button, which should be a permanent badge, and be the insignia of membership. The President said he would appoint the committee on Thursday morning.

The Committee on By-Laws and Constitution then made their report. It was laid aside to be acted upon Thursday.

Mr. Goldman made a motion that no Convention be held outside the state of Pennsylvania. Carried.

This motion was embodied in Section I of Article I, which section reads: "The meetings of this Association shall be held annually in the State of Pennsylvania, at such time and place as may be determined upon by a majority vote of the members then sitting."

The Committee on Copyright reported progress.

The Convention then adjourned to the Capitol, where Mr. F. E. Musser, of Harrisburg, made a photograph of the members, etc.

Thursday, January 28th, 1897.

In the afternoon a School of Photography was conducted at the gallery of Mr. F. E. Musser, by Mr. Rockwood, of New York, which was largely attended. In the evening a "Lantern Slide" was given in the hall by Mr. Buchanan, of Philadelphia. The room was filled by about four hundred of the citizens of Harrisburg beside the photographers.

The President called the meeting to order at 10.30, and read an invitation from Mr. Roger L. Kirk, inviting the Association to meet him at the Grand Hotel this evening. It was worded as follows:

"Mr. Roger L. Kirk, of Wilson, Hood, Cheyney Co., having secured Mr. Buchanan's prize, feels the responsibility of carrying it home (inside him) too heavy, and desires to ask the Association to share his burden with him.

"For that purpose he invites all to meet him this evening at the Grand Hotel to further investigate the solid and liquid possibilities of the city of Harrisburg. He would be pleased to have all who can come to notify him that he may make suitable arrangements."

The President appointed the following committee to design and obtain badges for the Association: Mr. Alfred Holden, of Philadelphia, Mr. Charles Griffin, of Scranton and Mr. Elwood Newell, of Philadelphia.

The Committee on By-Laws and Constitution then made their report, which was as follows:

In Article 2, Section 1, which reads: "Any photographer, either profes-

sional, employe, student or retired, any portrait artist, any manufacturer or dealer in photographic stock or artists' materials, dry-plate manufacturer or his representative, any or all of the foregoing in Pennsylvania shall be eligible to membership, if they comply with the By-Laws of this Association, and can fulfill the requirements thereof." As amended it reads as follows:

"Any photographer, either professional, employe, student or retired: any portrait artist; any manufacturer or dealer in photographic stock or artists' materials, dry-plate manufacturer or his representative, any or all of the foregoing in Pennsylvania, Maryland or Delaware, shall be eligible to membership, if they comply with the By-Laws of this Association, and can fulfill the requirements thereof."

Article 3, Section 1, which reads: "Any resident of the state who is eligible may become a member of this Association by making application to the Treasurer, signing a copy of the Constitution and By-Laws, and paying an initiation fee of two dollars and one year's dues of one dollar, in advance," was amended to read as follows:

"Any resident of the states heretofore mentioned who is eligible may become a member of this Association by making application to the Treasurer, signing a copy of the Constitution and By-Laws, and paying an initiation fee of two dollars and one year's dues of one dollar, in advance."

Section 2 of Article 3 which reads: "Any non-resident of this state who is eligible to honorary membership, may become such by remitting initiation fee to the amount of two dollars in advance to the Secretary of this Association. They shall not be eligible to officiate or vote at any of our meetings," was amended to read as follows:

"Any non-residents of these states who are eligible to honorary membership, may become such by remitting initiation fee to the amount of two dollars in advance to the Secretary of this Association. They shall not be eligible to officiate or vote at any of our meetings."

Of the By-Laws, Section I of Article 2, which reads: "The officers of this Association shall hold office one year from the first day of January following their election, or until relieved by their duly elected successors," was amended to read as follows:

"The officers of this Association shall hold office one year from the first day of July following their election, or until relieved by their duly elected successors."

Section 5 of Article 2, "It shall be the duty of the Executive Board to appoint the Judges of all classes." This is a new Section.

Mr. Kellmer moved that the amendments relative to terms of admission of members from other states be laid over for one year. It was carried. The Secretary read a telegram from Mrs. Clark, of St. Louis, sending her

regrets that she could not be present. He also read a message from the President of the National Association, expressing regret.

The President then said:

"I have been assured personally by a large number of the members of the Association of what an elegant time they have had here. The exhibits here have pleased them immensely and have caused them to feel very grateful to the Board. We have had a little more expense here than we thought, bringing Mr. Rockwood from New York, but I know you were glad that he was here, and I will ask for a little more from you so that we will not leave here in debt. Thus we will make this Convention a grand success."

The hat was then passed and sixty-four dollars was raised.

Mr. Horgan then suggested a little scheme for raising money by selling tickets, and offering a souvenir medal to the one drawing the lucky number. The President appointed Mr. Horgan, Mrs. E. E. Seavy and Mrs. Schreiver, a committee to sell the tickets.

Mr. Hemperly then introduces Mr. Alfred Holden, of Philadelphia, who made a very interesting speech on "To-day and the Future."

Mr. Kellmer moved that "the Executive Board be empowered to select a picture for the first prize winner, the Grand and Class A, each year, with the consent of the photographer, and that the picture be placed in the salon and kept by the Association." The motion was carried amid applause.

Mr. Kellmer made another motion, as follows:

"That the judges select the finest portrait in the hall for the upper salon, and that said portrait be sent to the National Convention at the expense of the Photographers' Association of Pennsylvania, as the grand prize of Pennsylvania." The motion was carried after round after round of applause.

The President then spoke on the importance of Class "F," and urged upon the members to exhibit in this class as it was an important one, showing the average work.

Mr. Morrison, of Pittsburg, moved that hearty thanks be returned to the officers for the good work, and also to the exhibitors, and to Mr. Buchanan for his very fine entertainment. Cheers followed the carrying of the motion.

The President announced that the awards for prizes would be made at two o'clock. The Convention then adjourned.

The President, Mr. Hemperly, called the meeting to order at half-past two. The drawing was then had of the souvenir medal, which netted the Association \$51.06. Mr. Roger L. Kirk was the lucky winner of the medal.

A general talk followed, one suggestion by the President being a very

excellent one, viz., that the photographers should write on the pictures the name of each artist who did any work upon it.

The Grand Prize, a bronze figure, was won by B. L. H. Dabbs, of Pittsburg, Pa.

The second was a diploma, won by Charles L. Griffin, of Scranton, Pa. The third was a diploma, won by J. W. Roshon, of Harrisburg, Pa. The other prizes were as follows:

CLASS "A."

ist.	Gold	Medal,	 	R.	W.	Phillips,	Philadelphia.
		the second second					

CLASS "B."

- 2d. Bronze Medal, H. S. Betts, Mt. Carmel.

CLASS "C."

- 1st. Silver Medal, B. Frank Puffer, Wellsboro.
- 2d. Background and Diploma, A. L. Rogers, Chambersburg.

CLASS "D."

- 1st. Silver Medal, B. Frank Puffer, Wellsboro.
- 2d. Background and Diploma, L. C. Smart, Renova.
- 3d. Diploma, L. V. Kupper, Edinboro.

CLASS "E."

- 1st. Bronze Medal and 10 Gr. A. Plate Paper, B. Frank Puffer, Wellsboro.
- 2d. Diploma and 15 Gr. Paper,J. Will Kellmer, Hazleton.
- 3d. Diploma and 5 Gr. Paper,John H. Kemp, Scranton.
- 4th. Diploma, Otto E. Webber, Lancaster.

CLASS "F."

- 1st. Silver Medal, L. V. Kupper, Edinboro.
- 2d. Wilson Encyclopedia. Otto E. Webber, Lancaster.
- 3d. One Year's subscription to "St. Louis Photographer,"

W. A. Moorehouse, Bedford.

CLASS "G."

- 2d. Shutter by Bausch & Lomb, and Diploma...James L. Dillon, Phila.

FIRST SPECIAL PRIZE.

25x30 Sepia or Water Color, suitably framed, by Sprague & Hathaway.

1st. B. L. H. Dabbs, Pittsburg.

2d. R. W. Phillips, Philadelphia.

3d. Charles Fritsch, Pittston.

4th. B. Frank Puffer, Wellsboro.

The Second Special Prize was given by Wilson, Hood, Cheyney Co., a Lens for Hayhurst marking for all classes except the grand prize.

Mr. Schreiver's picture of the "Madonna" was announced as the picture selected out of the entire hall to be sent to the National Convention. The Judges also recommended to the special attention of the Convention the study of an old man reading, by Mr. Flickinger, of Bethlehem.

Mr. Schreiver made a motion that Mr. Flickinger's picture be hung beside his in the National Convention. This motion aroused a great deal of enthusiasm.

The Convention adjourned at 4 o'clock.

In the evening Mr. Roger L. Kirk entertained the members of the Association at the Grand Hotel, where a royal repast was served. Mr. Kirk presided with dignity, and the members responded very liberally and enjoyed the evening very much. They gave Roger three rousing cheers and left at one o'clock in the morning.

PHOTOGRAPHIC PATENTS.

List of patents relating to photography reported for this paper by Wm. N. Moore, Patent Attorney, Washington, D.C. Copies of patents can be had for 25 cents each. Issue of January 19th, 1897.

No. 575,350—Burnishing machine. W. K. Harrington, Rockford, Ill. It consists of the supporting frame, a burnisher, and means for automatically imparting an oscillatory and bodily swinging movement to the burnisher.

No. 575,431— Panoramic camera. Schoenfelder & Kehle, Newark, N. J. It consists of a support, a cylindrical film-holder on said support, a cylindrical casing surrounding said film-holder and loosely mounted on said support and provided with a vertically arranged slot, a lens-carrying funnel surrounding said slot and projecting horizontally from the casing, a shutter carried by said funnel, and means for revolving the casing.

The Editorial Dropshutter.

A perfect Blotter.—In this age of aristo, prints, when the slightest impurity will affect tone and finish, photographers will appreciate the importance of having a blotter which is chemically pure.

The "World" Special Photo-finish Blotting Paper, it is claimed, contains no wood pulp or clay, being made entirely from cotton rags, and is therefore an ideal absorbent in drying prints. It does not affect the prints.

It is being introduced generally in the photographic trade, and may be obtained through any regular photo stock dealer.

Lord Kelvin's Discussion of Edward P. Thompson's book on Roent-gen Rays.—I received it only a few days ago, but I have already looked nearly all through it, with great interest. I have seen enough to know that I shall find much most-useful information in it which will be always readily available, because of the very excellent method and care with which you have given references to authors' dates and publications, and I am sure that all who are interested in the subject will find your book exceedingly valuable. All your statements with reference to anything I have done on the subject are perfectly correct. I believe that hitherto nothing in the way of diffraction has been discovered for the Roentgen rays.

Announcement.—On December 18th, 1896, the good will, outfit, back numbers, stationery, etc., of *The Observer* (practical microscopy, Portland, Conn.), were purchased of the trustee by Mrs. E. A. Pelton, of Portland, who is the mother of Mrs. E. F. Bigelow. Mrs. Pelton has appointed E. F. Bigelow as agent and managing editor of *The Observer* and the magazine will be continued practically as before except with many plans and reasonable expectations of improvement for 1897.

Anhydrous Formaldehyd Gelatine. — Letters patent have been granted to G. F. Hauser, of Erlangen, Germany, Assignor to the Chemishce Fabrik auf Actien, vormals E. Schering of Berlin, Germany, for a composition consisting of gelatine and formaldehyd, combined in such proportion and in such manner that the resulting composition is capable of resisting moisture and heat. We quote from Letters Patent No. 572,295, dated December 1st, 1896, the following claims:

"I. The herein-described waterproof composition which consists of anhydrous formaldehyd gelatin free from photo-sensitive ingredients.

2. The herein-described method of producing a waterproof gelatin com-

position which consists in subjecting the gelatin, free from photo-sensitive ingredients, to the action of a watery solution of formaldehyd, then removing the gelatin composition from the solution and then drying the same."

The composition of formaldehyd and gelatine is also patented in England, Italy, France, Austria, etc.

Society Notes.

Columbia Photographic Society.—The following bulletin has been issued by the Society:

The regular monthly meeting of the Columbia Photographic Society will be held at 8 o'clock sharp, and an interesting Lantern Slide Exhibit will be given, and, having received from the pool and billiard table over \$40.00, we will draw and pay off four of our bonds.

All members are requested to be careful to put their pool checks in the box for each game.

We have at this writing, 19 applicants to be balloted for, and we would like to make the number 25. Can't you bring in an application? You

We have at this writing, 19 applicants to be balloted for, and we would join for the social feature, with dues at only \$1.00 per month.

Special notice of future events:-Lantern Slide Contest, February 8th, and the Enlargement Contest, March 8th.

The Corliss Art and Camera Club of Newburyport, Mass., are to have an Exhibition of Photographs, February 25th and 26th, at which time 1,000 pictures will be exhibited by its forty members.

Detroit Convention.—It is probable that one of the most unique exhibitions shown at the P. A. of M. Convention will be a collection of pictures gathered for the occasion by C. L. Weed of the American Aristo Company, showing the evolution of Photography, from the days of Daguerre to the present time. There will be shown pictures made each year since 1835—first the Silhouette, or cut-outs, then the Daguerreotype, from 1840 to 1858; next the Ambrotype, from 1846 to 1860, made on clear glass, colored glass, leather, black enamel paper, rubber, ivory, iron and tin; and photographs made as early as 1854, and each year since. This will likely be the first illustrated history of picture making ever shown, and will be one of the leading attractions, as several talks will be delivered from them.

Virginia President A H Pleas

Photographers' Association of Virginia.-President A. H. Plecker, of Lynchburg, Va., has issued a circular, in which he announces that the time is drawing near for the First Annual Convention of the Photographers' Association of Virginia. He wants to see a large and handsome display in Richmond, on March 23d to 25th, 1897. Plecker says: "We have the metal and talent in this State, and I want to see it brought out. Let us not be behind other states, but go forward with our Art and show to this blessed country of ours that Old Virginia will plant her photographic banner as high in the Art as any other state, and she can do it if she will just lay hold. Remember, there are thirteen Gold and Silver Medals to be awarded, and one or more are for you, should you be found worthy. That is something for which to strive; but give us the pleasure of your presence, even if you do not exhibit. Hang a card on your door, saying you have gone to Richmond to attend the Photographers' Convention, and it will help your business, as your customers will say, "He is up with the times;" and a week off will rest you up and fit you for your Spring trade."

For further information, write to Secretary H. V. Lineback, Roanoke, Va., or A. Homeier, Richmond, Va., for space for your exhibit.

Yours very truly,

A. H. PLECKER, Lynchburg, Va., Pres't P. A. of Virginia.

A Lecturer's Grievance.-More than one well-known photographer, addicted to the generous habit of placing his services as paper-reader, discussion opener, and lantern lecturer at the disposal of photographic societies, has lately laid before us what we consider a real grievance which well deserves ventilation. It is nothing less than the meanness, the parsimony, and thoughtlessness of photographic societies in getting men to come from long distances to address them, not only without recompense, but with the additional privilege of having to pay their own railway fares, etc. We think that the least photographic societies can do in return for an evening's instruction or entertainment is to see that the man who, frequently at great inconvenience, gives his time and knowledge away for nothing, should not also be out of pocket as well. The secretaries of societies should take such a matter as this in hand, and at any rate tender a man his traveling expenses. It might not always be accepted; but the action would show that societies were alive to the fact that against the credit of the honor of addressing them photographic lecturers had very considerable debits in the way of time and money to place.

OUR ILLUSTRATIONS.

Frontispiece—An every-day specimen of studio portraiture from the galleries of Alfred Holden, Manayunk, Philadelphia.

The Behaim House—As an extra illustration we present a view of the Behaim House, in the ancient imperial city of Nuremberg, Germany. This house, with its mural decorations, is of great interest to us as it was the birthplace and home of Martin Behaim (1459-1506), the celebrated cartographer, by aid of whose improved nautical instruments, Columbus was enabled to cross the ocean and safely return to his port of departure. According to old traditions in the Behaim family, Martin is said to have discovered the eastern coast of South America several years prior to Columbus' first voyage. It is also stated that the straits which separate Terra del Fuego from the continent were discovered and mapped by this German navigator of the XV. century.

IT IS WELL TO REMEMBER.

That slander, like mud, dries and falls off.

That he who gathers roses must not fear thorns.

That to wait and be patient soothes many a pang.

That correction is good when administered in season.

That it takes a great deal of grace to be able to bear praise.

That you will never have a friend if you must have one without failings. That to have what we want is riches, but to be able o do without is

power.

That the man who cannot mind his own business is not to be trusted with the business of others.

That the roses of pleasure seldom last long enough to adorn the brows of those who pluck them.

A Fine Old Story.—Edmund Burke, that noble defender of liberty and freedom, was one day addressing a crowd in favor of the abolition of slavery.

In spite of his eloquent appeals, the crowd began to get hostile, and at last a rotten egg caught him full in the face. He calmly wiped his face, and quietly said:

"I always contended that the arguments in favor of slavery were rather unsound."

The crowd roared, and from that time he was no more molested.

BARGAIN LISTFEB., 1897.	1—5x7 Blair Rev. Back Camera, new with Darlot lens, \$28 oc
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PORTRAIT CAMERAS.	new 25 oc
[For Lenses see Special List,]	I-Student Camera, complete 1 50
-5x7 Victoria Camera, \$ 8 00	1—14x17 Ideal Camera, holder,
-11x14 Scovill Port. Camera,	tripod, Orthoscope lens and
Bonanza holder, 35 00	case, 90 o
-11x14 Anthony Port. Camera,	Without lens, 40 ox
Benster holder, 30 00	
8x10 attachment, 55 00	HAND CAMERAS.
-14x17 D. S. B. Portrait Camera, 40 00	
-5x8 Wet Plate Stereo. Camera,	1—4x5 Cycle Poco Camera, Turn-
3 holders, 20 oc	er-Reisch lens, 45 o
,	1-5x7 Folding Premo, R R lens, 25 of
VIEW CAMERAS.	1-4x5 Folding Premier, Darlot lens, new, 24 o
-22x28 American Opt. Co. View	1—4x5 Waterbury Detective Cam-
Camera, 22x28 Français lens, 150 00	era, 3 holders, 8 o
-11x14 Flammang R. B. Cam-	1-Vest Camera and Plates, 2 5
era, 4 holders, tripod, Eury-	I-No. I Kodak, 5 o
scope lens. Prosch shutter, . 100 00	1-5x7 Folding Kodak, new, . 45 o
-5x8 Blair Lucidograph, 4 00	1-4x5 Turnover Detective, new, 10 o
-4x5 New Model Imp., Darlot	1-4x5 Climax Detective, new, to o
lens, 3 holders, 18 00	1-6½ x8½ Premo Sr, no lens. 30 0
-4x5 New Model; 6 00	
-8x10 Blair, Rev. Back, good	ACCESSORIES.
order, 18 00	
-5x7 Universal Camera, 3 extra	3-4x5 Blair, Feather-weight hol-
holders, tripod, good as new, 24 00	ders, each,
-8x10 New Model Camera, 2 hol-	1—4x5 Roll Holder for Hawk Eye 5 o
ders, 9 ∞ -5x8 Wet Plate Stereo Camera,	6—Scovill Light-weight Holders,
1 pair Darlot lenses, 1 5x8	each,
Darlot lenses,	
-4 x 5 New Model Outfit, 6 50	1—Wood Stereo Exposer, 5
-6½ x8½ Novelette Camera, two	gas, 14 0
(2) extra Holders, Beck R, R.	3-Cross Collodion Filters, . each 1 of
Lens, Canvas Case, in good	I—IIXI4 Glass Bath, 2 o
condition. Cost \$107.00. Will	2-12x15 Glass Baths, each 3 c
sell for 60 00	50-61/2 x81/2 Printing Frames, each
-4x5 New Model Imp. Camera,	2—IOXI2 " " "
Wray lens, 6 extra holders, . 34 co	
Wray lens, 6 extra holders, . 34 co	
-4x5 New Model Imp. Outfit, . 10 00	5-No. 6 H. R. Dippers,
-4x5 New Model Imp. Outfit, . 10 00 -5x8 Genessee Outfit, 3 extra	5-No. 6 H. R. Dippers,
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-4x5 New Model Imp. Outfit, . 10 00 -5x8 Genessee Outfit, 3 extra holders 13 00 -8x10 N. P. A. View Camera	5—No. 6 H. R. Dippers,
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-4x5 New Model Imp. Outfit, . 10 00 -5x8 Genessee Outfit, 3 extra holders 13 00 -8x10 N. P. A. View Camera and 1 extra holder 10 00 -5 Scovill light-weight film	5-No. 6 H. R. Dippers,
-4x5 New Model Imp. Outfit, . 10 00 -5x8 Genessee Outfit, 3 extra holders 13 00 -8x10 N. P. A. View Camera and I extra holder 10 00 -5/6 Scovill light-weight film holders, each 1 00	5-No. 6 H. R. Dippers,
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-4x5 New Model Imp. Outfit, . 10 00 -5x8 Genessee Outfit, 3 extra holders	5-No. 6 H. R. Dippers,
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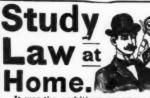
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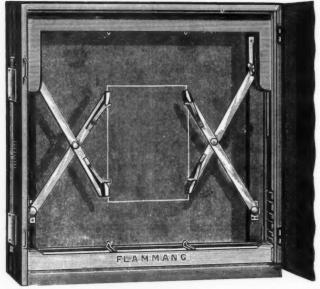
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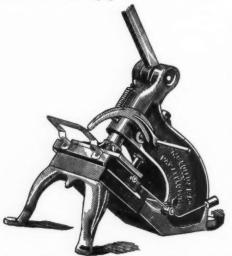
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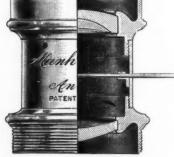
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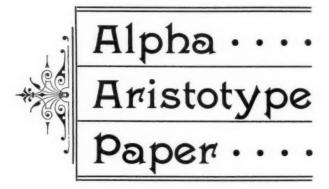
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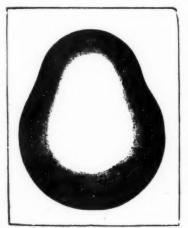
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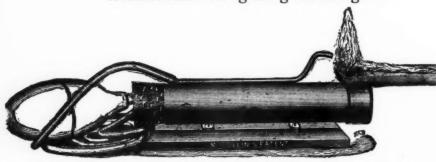
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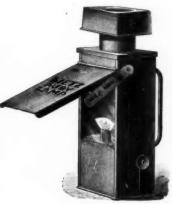
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Takes the place of daylight on dull days, takes the place of a skylight on bright days.

As manufacturers of Blitz Pulver, which is used by all manufacturers of Professional Flash Machines, we feel that we are in a position to know what photographers want.

We believe FLASH LIGHT WORK HAS COME TO STAY, and after careful experimentation, we have produced a lamp which combines SIMPLICITY, ECONOMY AND EFFICIENCY. We invite correspondence from photographers, and will publish from time to time samples of the work of the machine in this journal.

This machine requires no gas or gasoline,—burns alcohol,—and is used with Blitz Pulver exclusively. The cut will show its construction.

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NOTICE OF INFRINGEMENT SUIT
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BROOKLYN, N. Y., DECEMBER 15, 1896.

TO THE TRADE.

We desire to inform you that we have just brought suit against a dealer in New York City, who, after ample warning and specific notice from us, persisted in infringing our Patent rights by continuing to sell "Stafford's Concentrated White Paste" and "Stafford's Invincible Liquid Gum." These two articles are manufactured by some parties doing business under the name of S. S. Stafford in New York City, and we consider the said articles to be imitative of our Photo-Mounter and our Taurine Mucilage respectively, and to be an infringement of our Patent No. 466,239 of December 29, 1891, of which we gave you previous notice in our circular of September 21, 1896.

You are doubtless aware that a Patentee has the right to sue either an infringing manufacturer or dealer, as he may elect, and it was necessary to bring suit against this dealer because, while the Trade has generally recognized our rights and co-operated with us in agreeing not to sell infringing goods, there were a few dealers here and there who have been misled to believe that we had no legal rights, or that if we had, we were in vulgar phrase "playing a bluff," and would not or could not enforce them. Such dealers, and the manufacturers behind them, could therefore only be convinced of their mistake by the course we have taken.

We have made every reasonable effort to avoid any trouble to dealers in this matter, but in view of the several misleading statements made by infringers, and their influence on some dealers, it was necessary to take this course to have our rights respected and to vindicate our sincerity and good faith to the Trade in general, and we are confident that the Trade will generally commend us in this position.

It is also proper that we should here call the attention of the Trade to a misleading statement made in a circular issued by Stafford, October 15, 1896. In this circular, which purports to be an answer to our Infringement Notice of September 21, 1896, and is signed in the name of "S. S. Stafford," who died over a year ago, it is stated that the Stafford Paste is made by a formula known only to "myself," and "that it is composed of ingredients different from those used by any other manufacturer." This latter statement we pronounce absolutely false or misleading. Repeated analyses of the Stafford Paste made by our experts show conclusively that it contains the ingredients of our Paste specified and claimed in our Patent No. 466,239, and in their opinion is a clear infringement thereof. This question of identity and infringement will now be submitted to the Courts for legal decision, and we will not discuss it further.

We again warn the Trade of their liability in the further sale of the "Concentrated White Paste" and "Invincible Liquid Gum" above mentioned, on which suit is now brought, but by communicating with us satisfactory arrangements can be readily made as regards infringing goods which they may now have on hand.

Very respectfully,

Chas. M. Higgins & Co.

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"Solio will not keep," shouted the rivals,

But Solio Sales Increased!

1894.

Louder they cried, "Solio is not permanent."

But Solio Sales Doubled!

1895.

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1896

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But Solio Sales Eclipsed all Records!

1897

They're shouting yet.

But Solio Sales Increase!

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